CLAIMS

1. A plant for producing a compressed fluid, comprising:
- n compressors, n being greater than or equal to 1, the delivery side of which is connected to a compressed fluid network,
- for each of the compressors, a connecting line connecting it to a power source,
- for each of the compressors, at least one switching means designed to trigger the change in status of each of the compressors,
- at least one pressure sensor designed to measure the pressure of the fluid in the compressed fluid network, and
- at least one control means designed to control one or other of the switching means,

characterized in that:
the singular or plural control means are connected to one or more individual actuating means for actuating each of the switching means, and
the singular or plural control means comprise one or more selection means able to select one or more compressors that are to be either started, or switched to idling, or switched to compressing, or switched off, according to a predetermined selection protocol dependent on the pressure of said compressed fluid in said network.

2. The plant as defined in claim 1, in which the compressors used are preferably of the "all-or-nothing" type.

3. The plant as defined in one of claims 1 and 2, in which the compressors are identical.

4. The plant as defined in any one of claims 1 to 3, in which the compressed fluid is compressed air.

5. The plant as defined in one of claims 1 to 4, comprising from two to six compressors.

6. The plant as defined in one of claims 1 to 5, comprising at least one data acquisition means able to date and to determine each change of status of each compressor constantly or discontinuously over time.

7. The plant as defined in one of claims 1 to 6, in which the control means comprise a programmable controller characterized in that it comprises a central unit comprising a memory and a computer program able to select, when the pressure P observed exceeds the pressure thresholds PSH or PSL, the compressor or compressors which, at a given moment t, need to be either started, or switched to idling, or switched to compressing, or switched off and possibly means allowing it to be controlled remotely, and in that it is able to operate using a program designed for the selection protocol as defined hereinabove.

8. The plant as defined in one of claims 1 to 7, in which the compressors are connected in parallel via their delivery side to a buffer reservoir of compressed fluid by means of a first linking pipe, said buffer reservoir being connected to the compressed fluid network by a second linking pipe equipped with a shut-off valve.

9. The plant as defined in claim 8, in which the first linking pipe is equipped with a filter.

10. The plant (2) as defined in one of claims 1 to 9, comprising:

- three compressors (4), (6) and (8), each equipped with a switching means (32), (34) and (36), which are

connected in parallel to the inlet (10) of a buffer reservoir (12) of compressed fluid by means of a first linking pipe (14) equipped with a filter (16); an outlet (18) of the buffer reservoir (12) is connected to a compressed fluid user network by means of a second linking pipe (20) equipped with a shut-off valve 22;

- a three-phase power source (24);
- three three-wire connecting lines (26), (28), (30) each connecting one of the compressors (4), (6) and (8) to the power source (24);
- a pressure sensor (54) for sensing the pressure of the fluid, located downstream of the compressors (4), (6) and (8) in the fluid network, for example in the buffer reservoir (12);
- a control device, in this instance a programmable controller CMD, comprising:

a central processing unit (CPU),

a memory (MEM) in which the upper pressure threshold PSH and lower pressure threshold PSL are stored, together with all the acquired data relating to the parameters and variables mentioned hereinabove,

a program (PRG) for controlling the plant able, when the observed pressure P crosses the pressure thresholds PSH or PSL, to select that or those compressors which, at a given moment t, need to be either started up, or switched to idling, or switched to compressing, or switched off,

an input (56) connected to the pressure sensor (54) by a sensor line (58),

detection means for detecting a failure of one of the components of the plant (2), which are connected to a telephone line (80),

three outputs (60), (62) and (64) connected to first (66), second (68) and third (70) control lines for controlling the switching means (32), (34) and (36), the outputs (60), (62) and (64) and the associated control lines (66), (68) and (70) being designed to switch over each of the compressors into one or other of the following three statuses: off,

idling and compressing; the outputs (60), (62) and (64) being slaved by the central processing unit CPU of the controller CMD to the pressure of the fluid P.

11. A method for producing a compressed fluid using the plant as defined in one of claims 1 to 10, characterized in that it comprises, in the course of time, one or other of the following operating steps:

(a) - when the pressure of the fluid in the compressed fluid network downstream of said plant lies in a range of values ranging between the upper pressure threshold PSH and the lower pressure threshold PSL, the pressure of the fluid in said network is maintained within this range of values by means of at least one of the compressors of the plant;

(b) - when the pressure of the fluid in said network drops below PSL for a parametrizable length of time,

(i) - either just one of the compressors of the plant is switched off, with the others compressing, in which case said switched-off compressor is switched on and switched to compressing;

(ii) - or several of the compressors of the plant are switched off, with the others compressing, in which case the switched-off compressor whose number of start-ups per hour in the last hour (N_D) is the lowest is switched to compressing and, if several of the switched-off compressors have this same minimum (N_D), the one whose total running time (TMG) is the shortest is switched to compressing;

(iii) - or all the compressors of the plant are switched off, in which case the switched-off compressor whose (N_D) is the lowest is switched to compressing and, if several of the switched-off compressors have this same minimum (N_D), then the one whose (TMG) is the shortest is switched to compressing;

(iv) - or just one of the compressors of the plant is idling, the others compressing or being switched off, in which case said idling compressor is switched to compressing;

(v) - or several of the compressors of the plant are idling, the others compressing or being switched off, in which case the idling compressor whose time to next available start-up (TRDEM) is the longest is switched to compressing and, if several of the idling compressors have this same maximum (TRDEM), then the one whose (N_D) is the highest is switched to compressing and, if several of the idling compressors have this same maximum (TRDEM) and this same maximum (N_D), then the one whose (TMG) is the shortest is switched to compressing;

(vi) - or all the compressors of the plant are idling, in which case the idling compressor whose (TRDEM) is the longest is switched to compressing and, if several of the switched-off compressors have this same maximum (TRDEM), then the one whose (N_D) is the highest is switched to compressing and, if several of the switched-off compressors have this same maximum (TRDEM) and this same maximum (N_D), then the one whose (TMG) is the shortest is switched to compressing;

(c) - when the fluid pressure in said network becomes higher than PSH for a parametrizable length of time,

(i) - either just one of the compressors of the plant is compressing, the others being switched off or idling, in which case said compressor is switched to idling;

(ii) - or several of the compressors of the plant are compressing, the others being switched off or idling, in which case the compressing compressor whose number of available start-ups per hour (N_C-N_D) is the highest is switched to idling and, if several of the compressing compressors have this same maximum number (N_C-N_D), then the one whose TMG is the longest is switched to idling;

(iii) - or all the compressors of the plant are compressing, in which case the compressing compressor whose number of available start-ups per hour (N_C-N_D) is the highest is switched to idling and, if several of

the compressing compressors have this same maximum number (N_C-N_D), then the one whose TMG is the longest is switched to idling.

12. The method as defined in claim 11, in which, when a compressor has been idling for a length of time greater than the minimum idling before switch-off time (TMAV) and the number (N_C-N_D) is greater than or equal to 1, it is switched off.

13. The method as defined in one of claims 11 and 12, in which, when, in the plant, at least one of the compressors is switched off, and at least one of the compressors is compressing, when the time since the last start-up of said compressing compressor is greater than a switch-over time termed T_P, and its TMG is greater than the TMG of the switched-off compressor, the switched-off compressor is switched to compressing and the compressing compressor is switched off.

14. The method as described in one of claims 11 to 13, in which the compressed fluid is compressed air.

15. A computer program for carrying out the method as defined in one of claims 11 to 14.